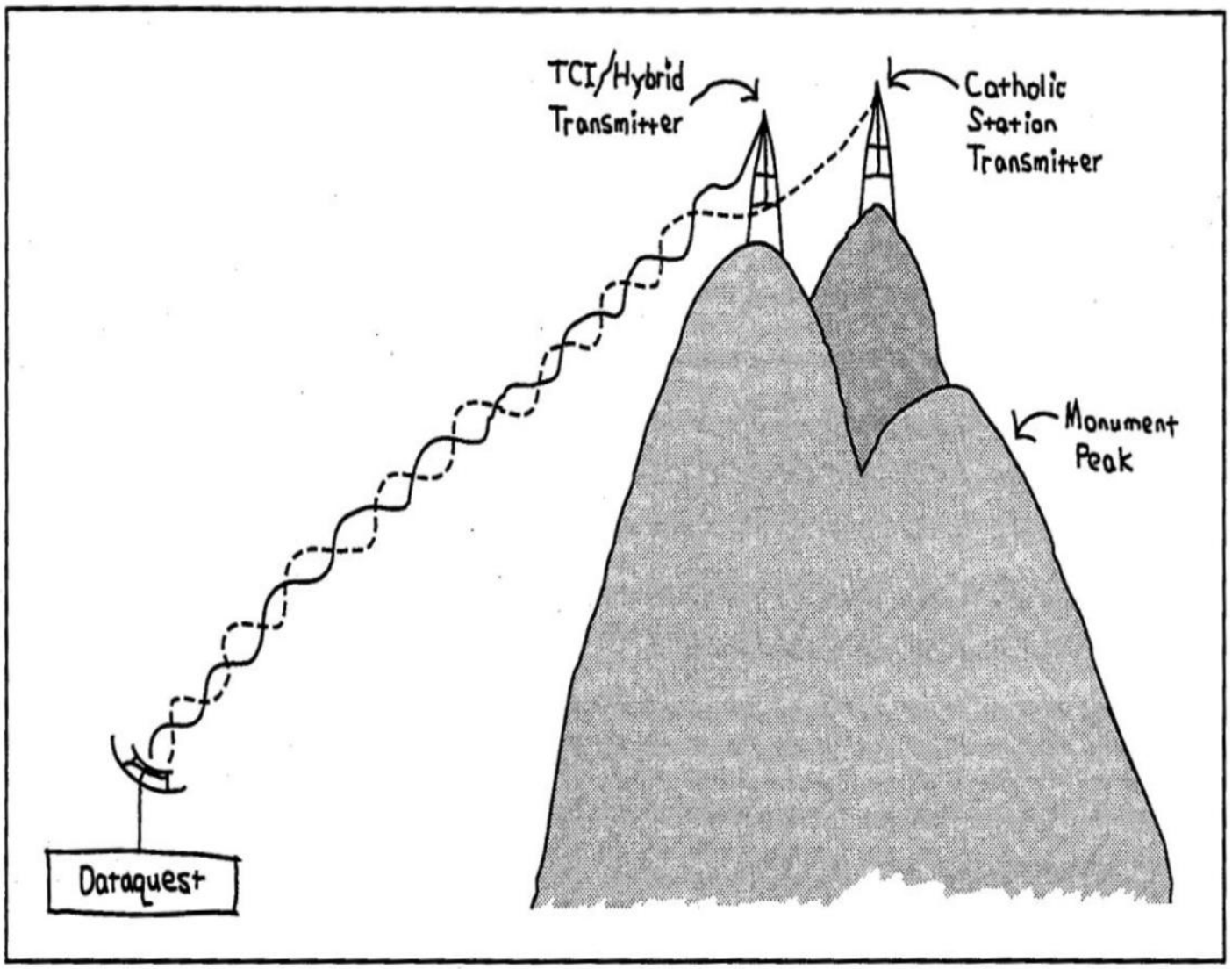
Figure 1
How the Pope Kept Me Off the Data Superhighway



Source: Dataquest (June 1994) G4002991

How the Pope Nearly Kept Me off the Data Superhighway

It's true. If there was ever a story to illustrate the drive to "get connected to the Web," the glory and vicissitudes of early adopter technology, and the ultimate conquering of signal-to-noise problems by engineering prowess and pure tenacity, this is it.

True enough, for several months, I had a simple dial-up account with an Internet service provider. Like many Internet users, I was faced with a grand treasure chest of information. However, the character interface was

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a leveling experience—good for understanding the most typical Internet connection but totally unsatisfactory for getting information rapidly. Within a company focused on chargeable hours and revenue per minute, my productivity was leveled. On top of this, my Internet service provider, like many other providers, was growing exponentially. The dial-up lines were often jammed. And then a well-meaning novice programmer would get his or her program into a continuous loop and steal all the CPU cycles. Enough of this great leveling experience. Time is money. I needed a new host, a new connection, and a bigger machine.

As an analyst tracking the Internet, I was hell-bent to get a good IP connection at a reasonable speed (T1 minimum) to experience the most advanced Internet tools—the full-blown hypermedia delivery via Mosaic, the Web Home Pages of mtv.com, the MIT Telemedia Laboratory, the Hungarian home page, Dr. Fun, the creation of HTML documents myself, and yea the Multicast Backbone (Mbone).

To understate the issue, the barriers were immense. My company, with its PC Windows and Novell IPX LAN, didn't initially view my quest as high priority. Indeed, introducing IP connectivity to the Novell LAN, especially with the press coverage of Internet crackers, gave IS the willies.

To make a longer story short, using a blast of SMTP (Simple Mail Transfer Protocol) conducted for a month, I convinced Sun Microsystems (my alma mater) to loan me a grand demo system: a 2-CPU SPARCstation 10 SX with 64MB of memory, a 400MB drive, 24-bit graphics, and a CD-ROM drive. Geoff Baehr, chief technology officer for SunConnect, even gave me his Mosaic Hotlist. Truly I was blessed. (And truly Sun was waiting for my superhighway demo on my local KNTV television spot.)

Well, I had the IP stack but no connection. IS was not impressed with my clever machine acquisition: a T1 link, yea a 56-Kbps line, was not in the budget picture.

I brightened up a bit when my Internet service provider was looking for rental space to set up a new point-of-presence (POP). Aha, I thought, the T1 link would come to me! The blind passion of my T1 frenzy was such that I had talked to our facilities manager and CFO about this before realizing that my service provider was already in this POP. Ga-doing. I quickly branched: my home in Mountain View! I would rent out space, get the T1 link, and take a tax deduction. Alas, the service provider was already in that POP. Ga-doing again.

I was getting desperate. Then I remembered Hybrid Networks. The small Cupertino start-up has a so-called "asymmetrical" architecture that uses both cable and telephone lines. The product uses RF modem technology for 10-Mbps downstream cable TV frequencies and sends return data over

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the conventional phone lines at 9600 bps up to 19.2 Kbps. This was the same technology used to link up Monte Vista High School for Vice President Gore's Internet demo.

I called Hybrid Networks, and, miraculously, it was amenable. The easiest solution was to hook up using its cable frequency negotiated with TCI. It took only one call to our facilities manager to get the answer: Yes, we had cable. No, it was not TCI.

I definitely was feeling thwarted. (As you are now, too, wondering where the Pope comes in here. Just wait.) Luckily, Hybrid Networks had another solution: a TV. The question was: Was Dataquest's building in the line of sight of its transmitter tower on Monument Peak? Not being particularly well-schooled on our local geography, I learned the general direction from someone who had time for such things. Fully determined, I threw off my high heels and clambered atop the roof of our building. I had that feeling of Columbus first sighting the shores of America as I found a distinct grouping of radio towers on a mountain peak to the northeast. Yes, we were in the line of sight!

Now nearly tasting the close of the hunt, within a matter of days, two erstwhile Hybrid Networks engineers arrived, Howard and Don, my heroes. Armed with a three-foot antenna, the Hybrid Network Link Adapter 100, a spectrum analyzer, and a SPARCbook for diagnostic testing, we waited while 150 feet of coaxial cable was dropped from the roof to my office. Alas, when the antenna was pointed and all set in place, the radio signal was weak. It appeared the signal was dropping 30dB; and although the adapter was synched, we were getting only a spare 10 packets per second. At first, Hybrid Networks' engineering believed it was the quality of the coaxial cable. Putting in an in-line amplifier merely amplified both the noise and the signal. They were perplexed. I was vexed. This was a mystery because the same configuration was up and running at nearby Intel in Santa Clara. It was now two months since I had set out on my mission.

After some consultation with Hybrid Networks' RF experts, Howard and Don concluded that the problem was coming from a nearby TV frequency band. Here enters the Pope: the nearest frequency band, also emanating from Monument Peak, was none other than the Catholic television station. The spectrum analyzer revealed that its signal was huge. And the phase of its signal was effectively canceling my IP packet transmission (see Figure 1). Hmmm... Were they bleeding over their frequency region? Was this an issue for the FCC? My spirits fell; this was worse than an engineering debugging exercise—this was politics.

Ed Moura, Hybrid Networks' VP of Network Systems, took the task to negotiate with the Catholics. I was assured that FCC neighbors are quite neighborly about these things. Alas, a small wireless data superhighway project was no match to voice signals conveying world peace. The Catholic station was busy; it was not able to allocate resources to the project right now. My spirits fell further.

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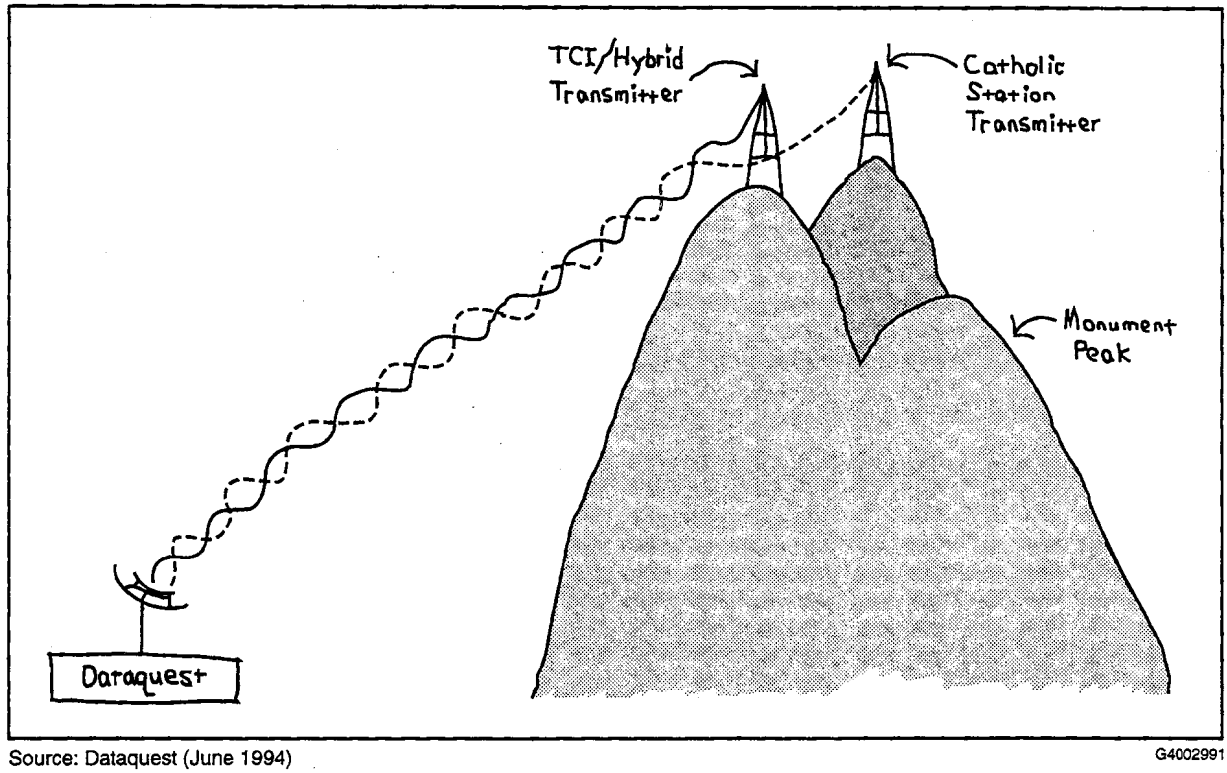

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Undaunted, the erstwhile engineering team ordered a frequency notch filter to knock out the world peace initiative (at least in my direction). It worked. With the Hybrid Networks signal fully synched and the projected 300 Kb/sec measured at the Sun workstation, I was up. Mosaic came up. As I typed the Uniform Resource Locator (URL) address, the small globe on the Mosaic home page began spinning. The message saying, "Done sending HTTP request; waiting for response" reassured me that I was now a full-fledged citizen of the World Wide Web (WWW). Note the cable head-end-to-air version of the Hybrid Networks adapter allows "best case" of about 3 Mb/sec, twice T1 speed (1.5 Mb/sec). I share this signal with five other Hybrid Networks users—although we rarely collide with simultaneous usage. I can and do occasionally ftp[1] gargantuan files that few users would touch—like 30MB of video or sound clips.

And the line of analysts now outside my office seeking data on the Web does not bother me. (Analysts are data hounds—words of my successful data superhighway expedition spread rapidly, with analysts rapidly e-mailing their precious Web findings off my isolated system and into their own mail accounts.) However, the time I save in using Mosaic/WWW more than compensates for my altrusim in sharing this with other analysts.

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[1]ftp is an Internet "verb" referring to the use of the file transfer protocol.

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Note: The frequency notch filter is now built into the Hybrid Link Network Adapter.

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